

110.0001

THE CLAIMS

What is claimed is:

1. A current limiter device, comprising:
a signal path coupled between a first terminal and a second terminal, the signal path having a controllable impedance; and
a control path coupled between the first terminal and the second terminal, the control path controlling the impedance of the signal path to be a low impedance when a magnitude of a voltage difference between the first and second terminals is less than a first predetermined voltage differential, and controlling the impedance of the signal path to be a high impedance when the magnitude of the voltage difference between the first and second terminals is greater than a second predetermined voltage differential, the first predetermined voltage differential being less than the second predetermined voltage differential.
2. The current limiter device according to claim 1, wherein the control path is responsive to the second predetermined voltage differential between the first terminal and the second terminal by generating a substantially constant current.
3. The current limiter device according to claim 1, wherein the first predetermined voltage differential between the first terminal and the second terminal is less than about 1 V.
4. The current limiter device according to claim 1, wherein the second predetermined voltage differential between the first terminal and the second terminal is greater than about 10 V.
5. The current limiter device according to claim 1, wherein one of the first and

110.0001

second terminals of the current limiter device is coupled to an input circuit of one of an instrumentation device, a digital multimeter, an oscilloscope, a spectrum analyzer and a general-purpose data-acquisition device.

6. A current limiter circuit, comprising:

a signal path between a first terminal and a second terminal, the signal path including at least one depletion-mode device and a variable-impedance device; and

a control path coupled between the first terminal and the second terminal, the control path generating a substantially mid-point voltage between the terminals when a magnitude of a voltage difference between the first and second terminals is less than a first predetermined voltage differential, at least one depletion-mode device and the variable-impedance device each having a low impedance in response to the mid-point terminal voltage generated by the control path, the control path further generating a substantially constant current when the magnitude of the voltage difference between the first and second terminals is greater than a second predetermined voltage differential, the first predetermined voltage differential being less than the second predetermined voltage differential, at least one depletion-mode device and the variable-impedance device each having a high impedance in response to substantially constant current being generated by the control path.

7. The current limiter circuit according to claim 6, wherein each depletion-mode device of the signal path is an N-channel depletion-mode MOSFET transistor.

8. The current limiter circuit according to claim 7, wherein the variable-impedance device is a P-channel JFET transistor.

9. The current limiter circuit according to claim 6, wherein the control path

110.0001

includes at least one depletion-mode device.

10. The current limiter circuit according to claim 9, wherein each depletion-mode device of the control path is an N-channel depletion-mode MOSFET transistor.

11. The current limiter circuit according to claim 6, wherein the first predetermined voltage differential between the first terminal and the second terminal is less than about 1 V.

12. The current limiter circuit according to claim 6, wherein the second predetermined voltage difference between the first terminal and the second terminal is greater than about 10 V.

13. The current limiter device according to claim 6, wherein one of the first and second terminals of the current limiter device is coupled to an input circuit of one of an instrumentation device, a digital multimeter, an oscilloscope, a spectrum analyzer and a general-purpose data-acquisition device.

14. A current limiter device, comprising:
a first terminal;
a second terminal; and
a current limiter circuit coupled between the first terminal and the second terminal, the current limiter circuit having a substantially constant-resistance operating mode when a magnitude of a voltage differential between a voltage at the first terminal and a voltage at the second terminal is less than or equal to a first predetermined voltage differential, a substantially constant-current operating mode when a magnitude of the voltage

110.0001

differential between the voltage at the first terminal and the voltage at the second terminal is greater than or equal to a second predetermined voltage differential, and a transition operating mode when the magnitude of the voltage differential between the voltage at the first terminal and the voltage at the second terminal is between the first and second predetermined voltage differentials.

15. The current limiter device according to claim 14, wherein the first predetermined voltage differential between the first terminal and the second terminal is less than about 1 V.

16. The current limiter device according to claim 14, wherein the second predetermined voltage differential between the first terminal and the second terminal is greater than about 10 V.

17. The current limiter device according to claim 14, wherein one of the first and second terminals of the current limiter device is coupled to an input circuit of one of an instrumentation device, a digital multimeter, an oscilloscope, a spectrum analyzer and a general-purpose data-acquisition device.